

Serial No. 09/600,732
Docket No. TIENSE RAFF.26
Amendment E under Rule 116

REMARKS

Independent claim 65 has been amended to incorporate the limitations of claim 71, which has been cancelled. Claim 65 also has been amended in an earnest effort to address the 112 rejection and to clarify the claim. Claim 90 has been amended to clarify the claim. No new matter has been entered.

Before considering the specific art rejections, it should be noted the present invention relates to an improvement of the process for the manufacture of inulin from chicory roots, in which the improvement resides in the use of a particular source material. The characteristics of the particular chicory roots source material require that these roots have been obtained under conditions that differ from the ones known from the prior art, and that are non-obvious in view of the prior art. That is to say, and contrary to the Examiner's comments in the Office Action at page 3 and page 8 that "claim 65 recites a range of growing seasons and which implies that chicory could be seeded any day in a year and does not exclude any day of the year", Applicants point out and emphasize that said range of growing season constitutes just one out of several features of the claimed invention which involves a combination of all the features recited in claim 65, in particular those with respect to the chicory roots source material. In other words, the chicory roots could be seeded during any of the indicated periods, provided that also all the other features are met, in particular the features with respect to the duration of the growing period and the indicated climatological temperature conditions (as to temperature as well as to period during which said conditions are to be met).

That is to say, the subject claimed invention resides in the particular source material for the processes for the manufacture of inulin and inulin derivatives. This source material is

AYES SOLOWAY P.C.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
ANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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characterized by the combination of several features including seeding periods, lengths of periods of growth and harvesting /processing, and particular requirements for temperature conditions during certain, well defined periods of growth and harvesting/processing of the chicory roots.

Independent claim 65 defines the characteristics of the source material used in the process according to the subject invention which consist of the combination of all the indicated features that define the conditions for seeding, growing and harvesting/processing of the chicory roots source material.

Conventional source material, namely chicory roots cultivated and harvested/ processed under prior art conditions (i.e., conventional conditions), is clearly excluded from the scope of the claims of the subject patent application because said characteristics (thus the combination of the various features seen as a whole) are clearly not met by known (conventional) chicory roots source material.

Furthermore, the use of said particular source material in the processes according to the present invention clearly results in considerable technical advantages, including improved grades of inulin (Description p.13, lines 10-20 and p.16, lines 6-14), as well as an extension of the possible seeding, growing and harvesting/processing periods with resulting technical benefits (Description, p.24, line 33 to p.25, line 24).

Accordingly, it is submitted claim 65, as amended, and the several other pending claims meet the requirements of 35 USC § 112.

Turning to the art rejections and considering first the rejection of claims 65-78 and 89-97 as obvious from Yamazaki et al. in view of Van Den Ende et al., the disclosure of Yamazaki et

AYES SOLOWAY P.C.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7622
FAX. 520.882.7643

175 CANAL STREET
ANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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al. is considered as merely confirmative of the common knowledge. Besides, as acknowledged by the Examiner (Office Action, p. 4, last sentence of section 1), Yamazaki et al. do neither disclose nor teach the particular conditions for seeding + growing + harvesting/processing of the chicory roots source material for use in the manufacturing processes according to the present claimed invention.

Van Den Ende et al. does not supply the missing teachings to Yamazaki et al. Van Den Ende et al. neither disclose nor teach the particular conditions for seeding + growing + harvesting/processing of the chicory roots source material for use in the manufacturing processes according to the present claimed invention.

Indeed, the disclosure of Van Den Ende et al. only relates to a study regarding the seeding, growing, storing and forcing of chicory roots for the production of "witloof" (Belgian endive) (p.44, left column and Discussion, p. 47-49).

Besides, Van Den Ende et al. is absolutely silent about using the results of the study for growing chicory roots as source material for the manufacture of inulin and inulin derivatives. Therefore, apart from speculations based on hindsight, there is no incentive in Van Den Ende et al. for the skilled person to combine this prior art document with the disclosure of Yamazaki et al. in view of providing an improved process for the manufacture of inulin and inulin derivatives.

Furthermore, the disclosure of Van Den Ende et al. merely teaches that during the growing period there are changes in the SST-, FFT- and FEH activities in chicory roots, and that accordingly over the growing season, particularly at the end, and also during cold storage, there occur significant changes in the carbohydrate composition of chicory roots. However, it should be noted that particulars regarding the conditions that trigger said changes, in particular the

HAYES SOLOWAY P.C.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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degradation of inulin molecules by FEH activities, are not disclosed and that said conditions are certainly not delimited in Van Den Ende et al. In fact, Van Den Ende et al. teach away from growing chicory roots under (=while allowing) low temperature conditions, and thus teaches away from the subject invention that allows low temperature conditions during certain parts of the growing period of the chicory roots source material.

Furthermore, detailed examination of the conditions for growing chicory roots disclosed by Van Den Ende et al. reveals that these conditions do not correspond to the ones defined in the subject claimed invention. The difference clearly resides in the length of the growing period in combination with allowing low temperature conditions during certain parts of the growing period of the chicory roots and the required absence of temperature conditions that trigger the FEH gene in a delimited period before the harvesting/processing of the roots. Applicants furthermore refer the Examiner to their detailed comments on Van Den Ende et al. in Amendment D, Remarks, p. 8, last paragraph to p. 9, last full paragraph, which Amendment is incorporated by reference.

Furthermore, the skilled person had no common or prior art knowledge nor any teaching from the prior art, particularly Van Den Ende et al., pointing to the exact conditions that trigger the FEH gene and consequently the degradation of the inulin chains in the roots. Besides, the skilled person had no common or prior art knowledge nor any teaching from the prior art that would indicate to him that, once low temperature conditions that trigger the FEH gene had occurred during the growing period and thus the degradation of carbohydrates in the roots had been triggered, the FEH activity and thus the degradation of inulin molecules would not continue over the whole duration of the growing period, thus yielding at the end of the growing period chicory roots that contain only fructose and oligofructose (short-chain inulin molecules). In this

HAYES SOLOWAY PC.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
ANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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respect, Applicants emphasize that in accordance with the present invention, low temperature conditions that trigger the FEH gene are allowed during a well-delimited period of the growing period of the chicory roots, and that it was unexpected for the skilled person that after the occurrence of said conditions that trigger the FEH activity, nevertheless chicory roots are obtained that enable the manufacture inulin of at least standard quality.

These features are definitely not disclosed nor taught by a combination of Yamazaki et al. and Van Den Ende et al.

Thus, having regard to the disclosures per se of Yamazaki et al. and Van Den Ende et al. and having regard to the kind and purposes of the experiments disclosed by Van Den Ende et al., it has to be concluded that:

(i) there is no incentive for the skilled person to combine the teaching of Van Den Ende et al. with the one of Yamazaki et al.,

(ii) even if the skilled person would combine the teaching of both documents, said combination would not lead to nor teach the present invention,

(iii) the present invention is clearly non-obvious in view of the combination of the teaching of Yamazaki et al. and of Van Den Ende et al. because the subject invention is not directly and unambiguously derivable from said prior art combination by the skilled person.

Accordingly, even in view of a combination of the teaching of Yamazaki et al. and Van Den Ende et al., the conditions for seeding + growing + harvesting/processing chicory roots source material in accordance with the present invention (allowing even frost during a well delimited period of the growth period), which thus enable to extend the seeding + growing period

HAYES SOLOWAY P.C.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
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beyond the conventional one while nevertheless yielding inulin of standard quality or even of improved quality that presents a higher mean () than the standard quality, are clearly non-obvious for the skilled person. Therefore, the processes according to the present invention that use said chicory roots source material have to be considered non-obvious too. Thus, the rejection of claims 65-78 and 89-97 as obvious from Yamazaki et al. in view of Van Den Ende et al. is in error.

Turning to the rejection of claims 79-88 as obvious from Yamazaki et al. in view of Van Den Ende and Van Loo et al., claims 79-88 are directly or indirectly dependent from claim 65. The deficiencies of Yamazaki et al. and Van Den Ende et al. vis-à-vis claim 65 are discussed above. It is not seen that Van Loo et al. supplies the missing teachings to the combination of Yamazaki et al. and Van Loo et al. to achieve render obvious claim 65, or any of the claims, including specifically claims 79-88 which depend thereon.

Van Loo et al. (US 5,660,872), merely relates to a process for the manufacture of a particular grade of inulin, namely treatment of an aqueous polydisperse inulin solution by column chromatography to remove monosaccharides and disaccharides to yield inulin that is essentially free from mono-and disaccharides. The source material of the process is purified inulin or even crude inulin extracts obtained by conventional methods from plants, including from chicory roots (Col. 6, lines 50-63). However, Van Loo et al. is completely silent about the existence of the particular chicory roots source material according to the subject invention and its use in the manufacture of inulin and inulin derivatives.

Accordingly, the combination of Van Loo et al. with Yamazaki et al, or with Yamazaki et al. and Van Den Ende et al., does not teach the particular source material for the process for the

HAYES SOLOWAY P.C.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
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manufacture of chicory inulin and inulin derivatives according to the present invention. Hence, said combinations of the prior art do not render claims 79-88 obvious.

As pointed out above, chicory roots source material with the claimed characteristics is neither disclosed nor taught by the cited prior art (which embraces only chicory roots source material obtained by conventional cultivation and harvesting of chicory roots).

In this respect, Applicants emphasize that Van Den Ende et al. clearly relates only to conventional cultivation of chicory roots, and this only with respect to the production of Belgian endive. Clearly, Van Den Ende et al. does not contain any teaching nor gives any incentive to the skilled person to cultivate chicory roots source material otherwise than conventionally, and a fortiori not any teaching nor incentive to cultivate chicory roots source material otherwise than conventionally for the manufacture of inulin and inulin derivatives.

Furthermore, Yamazaki et al. in combination with Van Den Ende et al., or Yamazaki et al. in combination with Van den Ende et al. and Van Loo et al., neither teach the existence or the possibility to non-conventionally cultivate chicory roots source material according to the present invention, nor provide an incentive to the skilled person to substitute in the process for the manufacture of inulin and inulin derivatives, conventionally obtained chicory roots source material by non-conventionally cultivated chicory roots source material.

Thus, the possibility to obtain non-conventionally cultivated chicory roots source material was unknown and unexpected at the filing date of the subject patent application, and there was no teaching in the prior art to arrive at and use non-conventionally cultivated and processed chicory roots source material in accordance with the present claimed invention with a

HAYES SOLOWAY P.C.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
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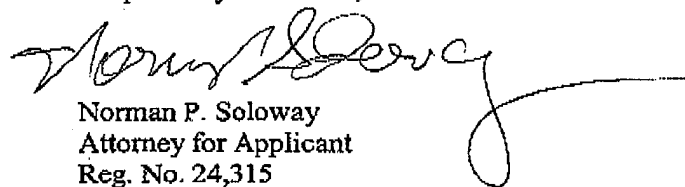
reasonable expectation of success to provide the improved processes for the manufacture of inulin and inulin derivatives according to the present claimed invention.

The possible existence of source material in accordance with the subject invention, its use for the claimed purpose, and the resulting technical advantages thereof, were not taught by any of the cited prior art nor by any combination thereof (Yamazaki et al. in combination with Van Den Ende et al. and Van Loo et al.). Accordingly, said source material, and thus the improvement to the process for the manufacture of inulin and inulin derivatives according to the present claimed invention, have to be considered non-obvious.

The foregoing amendment makes no claim changes that would require further search by the Examiner. The only substantive change to claim 65 was to include the limitations of claim 71, which the Examiner has already considered prior to its cancellation. Accordingly, entry of the foregoing amendment, and allowance of the application are respectfully requested.

In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our Deposit Account Number 08-1391.

Respectfully submitted,


Norman P. Soloway
Attorney for Applicant
Reg. No. 24,315

HAYES SOLOWAY P.C.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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HAYES SOLOWAY P.C.
130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567